BCS 100: Introduction to the Circumpolar North
University of the Arctic

MODULE 8: Stewardship of Resources & Sustainable Development

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Overview

This module will give you a brief overview of renewable and non-renewable resources, resource exploitation and stewardship challenges. It is important to focus on analytical concepts and approaches to problem solving because it will enable you to gain an essential understanding of how to manage resource extraction and resource use and the resulting environmental effects. We will also use an interdisciplinary approach in presenting the concepts in this module. That is to say, we use many different disciplines to explain resource extraction and management.

The module begins by briefly explaining the distinction between renewable and non-renewable natural resources in the context of common property, and the differences in how resources are managed. The module then examines three different resource management models, international cooperation, and constraints to implementing international policy at the local level.

Learning Objectives & Outcomes

Upon completion of this module you should be able to:

1. Understand common pool resources and the logic of "the tragedy of the commons."
2. Explore the relationships between different economic adaptation and management needs.
3. Describe the differences among the three main resource management models: state authority, market driven and resource co-management.
4. Summarize the details for basic international cooperation for sustainable development.
5. Evaluate the constraints to implementing the precautionary principle.

Required Readings

Caulfield, Richard A. 2004. "Resource Governance" In: *Arctic Human Development Report*. New York: United Nations Development Programme [UNDP]. P122-138.

Key Terms and Concepts

- Adaptive management
- Co-management
- Collective rationality
- Common pool resources
- Ecosystem management
- Ecosystems
- Individual rationality
- Limited access
- Market resource governance
- Participatory resource governance
- Open access
- Precautionary principle
- Private property
- Public governance
- Public property
- Resource rent
- Stewardship
- Tenure
- Tragedy of the Commons

Learning Materials

Introduction

The need for resource management models and resource stewardship, in general, depends on the state of the resource and the degree of resource exploitation. The Circumpolar North has a rich history of resource exploitation, causing formerly robust ecosystems to become more fragile. In the past, natural resources were somewhat protected by remoteness - distance to more populated areas - and the lack of extraction technology. That is no longer the case. Both modern technology and climate change have increased extraction and use of northern resources.

Like the dependence on marine resources for the early settlements of Newfoundland, we find that the whole of the many coastal communities in the north have been inseparably linked to natural resources both marine and terrestrial. For example, even though most of northern Norway is located north of the Arctic Circle, the winters are relatively mild and the climate is conducive to farming. Furthermore, since historic times we find that fishing is often combined with farming and reindeer husbandry, of which many different ethnic groups have adopted both. Similarly, people are reliant on natural resources whether they live settled or nomadic lifestyles.

With such sparse populations and rich natural resources, the Circumpolar North became attractive to resource exploitation by southerners. The first visitors and later settlers from the south made use of resources for profit rather than subsistence. In northern Canada the Hudson's Bay Company and the North West Company gradually expanded their activities into the northern interior, establishing permanent outposts for further economic expansion. At the eastern coast French and English fishermen from the early 1500s onward exploited rich cod resources. Such exploitation patterns were also true for the Siberian traders who settled in the 1600s on the coast of Alaska. But what really transformed the earlier pristine land of the interior

and the living conditions for the inhabitations, was the gold rush at the turn of the 19th century. Rumors of gold in the Yukon in 1896 drew people from the south, resulting in rapid growth of communities and economic activities along the Yukon River and its tributaries. This changed both the landscape and gradually, the lives of the peoples living in the affected areas.

The transformation of the northern economies took place in different ways and at different rates. At the turn of the 17th Century, industrialization led to the emergence of market economies. The growing exploitation of non-renewable natural resources greatly affected renewable resource systems. Habitats were degraded and even destroyed and many species were overharvested to the point of extinction. Rapid enhancements of technology such as greater sized vessels, and more efficient fishing and hunting gear substantially increased pressures on resources. Additionally, what was once a subsistence activity became commercial. For example, in Russia, after the 1917 revolution reindeer herding was industrialized.

Traditional ways of exploiting northern resources gave way to more efficient and industrialized resource exploitation. In most cases, the problem of overuse can be attributed to rapidly increasing demand and exploitation, and a system of common property, or open access. A spectacular example of overuse can be found in the world's fisheries. More specifically in Norway, fishing efforts increased beginning in the 1960s and commercial stocks of both herring and cod soon began showing signs of over-exploitation and even collapse. At the end of the sixties a licensing system for herring fisheries was introduced although it was too late; the stock collapsed and a fishing moratorium was introduced to help the herring stock recover. Similarly, the Norwegian arctic cod stock suffered from the same plight and fishing was eventually restricted by licensing and quotas. By the early nineties a severe resource crisis occurred and historic low total allowable catch quotas (TAC) had to be set. The overall result was that the Norwegian government adopted a regulative system to safeguard fisheries resources and prevent a total fisheries collapse.

Another important issue affecting the demand for and access to northern resources is climate change. Due to milder winters and a retreating ice cap in the Arctic, the possibilities for resource exploitation have been improved. This is pertinent for oil and gas exploration in areas formerly technically inaccessible for commercial activities. The biggest reserves of unexploited petroleum resources are estimated to exist in the Circumpolar North. Despite the search for alternative energy resources, oil and gas resources are still dominant because they are relatively inexpensive to harness and use to date. The Barents Sea, home to the Russian gas field known as Shtockman, is a case in point.

As areas become more accessible, natural resource ownership in the Circumpolar North has become a new concern on the political agenda. Vast areas of the Arctic have largely been international, not belonging to any nation state. This is about to change. The availability and importance of natural resources for economic development have sparked a debate and the beginnings of legal processes to extend national jurisdictions. The planting of the Russian flag on the seabed of the North Pole serves as a poignant illustration. Oil and gas are presently important ingredients of energy policy, and when big powers are affected, this turns into vital interests and high policy, calling for solutions by the international community.

The United Nations has taken the lead in finding solutions to such an issue. Arctic nation states have extended jurisdictions of the adjacent sea areas, from four nautical miles to twelve, then to 200 nautical miles by establishing exclusive economic zones. The Arctic countries are now pressing for an additional extension of their sea borders, to be able to secure and protect resources on connected via the continental shelf. With the increased focus on petroleum

resources under the sea, new sea borders and treaties are required to avoid future conflicts and resource depletion. Not only in the Barents Sea between Norway and Russia are there border disputes, but also between the US and Canada, and Canada and Greenland/Denmark to mention some of the most pressing ones. Such questions are also subject for handling by the United Nations, building on the Law of the Sea and the Convention on the Continental Shelf (1958).

8.1. Common Pool Resources

Natural resources are classified as renewable or non-renewable. All **renewable resources** are biological and are able to reproduce as long as their environments are healthy and conducive to reproduction. It is important to consider that renewable resources are also part of larger systems of resources that depend on each other; one layer often forms the base of existence for other layers. Together they form a complex chain of interdependence, often difficult to define given such complexity. Interference in the way of extraction or manipulation in these systems might easily offset the balance with irreversible effects such as the inability to reproduce in a sustainable way, depending on fragility or robustness. Today we find that both marine and land-based ecosystems in the north have changed their character from former robustness to being more fragile and stressed. **Non-renewable resources** are those that cannot reproduce, such as oil and gas, and minerals. Non-renewable resources are finite.

Access to natural resources has been a driving force for industrialization and economic growth throughout the Circumpolar North. But it should be added that these resources have been important for economic growth wherever there is a demand for them, and that northern resources have been an important source for economic growth in southern, more densely populated areas. Resources may be carried a long way from where they are found and do not necessarily provide economic growth to the areas where they were caught or extracted. In today's economy, we have reached a level of use, organization and technology that enables us to look for resources that earlier could not be exploited. In our globalized economy, distance no longer provides barriers to or protection from exploitation.

Natural resource use and rates of use are often governed by who owns, and who has access to a resource. There are four primary ways of holding or accessing a resource known as **tenure**:

1. **Open access**: provides access to a resource where there are no limitations as to who can use a resource or benefit from it. Often there is no jurisdiction over such resources, making management difficult.
2. **Common pool resources**: are held or accessed by a defined group sometimes known as the commons. That is to say, there are a limited number of stakeholders who can access the resource and use it. What is important to note is that common pool resources are sometimes referred to as open access and possess the same characteristics when the size of the commons becomes very large and unmanageable
3. **Public property**: is owned and governed by the state. In this case, public authorities are owners and establish rules and regulations regarding use and access.
4. **Private property**: Property or resources held privately are the most secure and usually provide the greatest incentive for responsible and sustainable management and extraction. Private property confers all benefits to a private owner of a resource who can exclude others from use or extraction, and who is fully responsible and liable for the benefits and costs associated with that resource.

You will note that resource tenures such as public and private are associated with "rights." Schlager and Ostrom in the "Rights to Nature" (1996), describe five sub-categories of rights as sticks in a bundle; access, withdrawal, management, exclusion and alienation. In many cases, individuals or groups who have rights to a resource do not have all subcategories, and some individuals have only **limited access**.

The sea and its resources provide a good example of the range of rights from open access to common pool access and public tenure. Hugo Grotius, the founder of the concept *Mare Liberum*—the unrestricted use of oceans, or freedom of the oceans—prevailed until the nation states started to expand their national control of sea territories. Both by unilateral and coordinated action in the wake of international agreements, the sea territories have been expanded to the present exclusive economic zones (EEZ), stretching 200 nautical miles (370 km) into the sea. Beyond the 200-mile limit, waters are international and, therefore, open access, making it difficult to monitor or control sustainable marine resource exploitation.

Looking at open access more closely and what it means for northern resources, we turn to one of the most quoted references in the literature: Garrett Hardin's article "The Tragedy of the Commons". Hardin argues that in a situation where there is a collective right to exploit an unmanaged natural resource, the stakeholder will act to maximize his personal profit by overexploiting the resource, thus leading to depletion of that resource. If an individual restrains their own exploitation or harvest, it will benefit only the other stakeholders. Therefore, the rational behavior as an economic actor is to maximize your own efforts and to harvest as much of the resource as possible. This is described as short-term individual rational action. And, even though you know your own behavior will lead to resource depletion, you would follow the short-termed **individual rationality** as long as the other resource users are behaving the same way. Hardin uses cattle owners and overgrazing as an example.

Learning Activity 1: Resources Tenure

Think about natural resources - who owns them, and who can benefit from them. Provide an example of a natural resource that is held as (a) open access, (b) common property, (c) public property, (d) private property.

The challenge is to be able to use natural resources in a long-term and sustainable way. To do this, we must discuss collective action and **collective rationality**. According to the economist Olson (1965), individuals in larger groups will not act to produce collective goods (i.e. goods for the whole group) without well-defined regulations. Furthermore, the bigger the group, the less inclined individuals will be to work for collective benefits. Putting restraints on your own actions would imply taking on individual transaction costs for the benefit of the whole group. Access to a collective good often results in the free-rider problem, whereby individuals receive benefits for which they did not have to work. For example, if one fisherman restrained his or her actions and reduced the catch so as to increase the overall fish population, a second fisherman would benefit in that there would be more fish.

Learning Activity 2: Video

Watch the video of Garnett Hardin explaining "the tragedy of the Commons and Resources." Website: http://www.youtube.com/watch?v=L8gAMFTAt2M

Ostrom (1990) follows up the free-rider argument by stating that an individual who cannot be excluded from the commons has no incentive to work voluntarily to provide the

common good. Or by putting it in economic terms, there is a lack of incentives to sustain a renewable natural resource. Free-riding then easily becomes the preferred individual strategy and short-term rationality that leads to gradual resource depletion. Therefore, where individual strategies are followed, resources often become depleted and degraded, or worse, extinct.

Group theories like Hardin's tragedy of the commons and Olson's theory on collective action are only theoretical approaches to dilemmas we face in real life. While they both provide extreme examples, they are important contributions to help understand what drives people to over-harvest and act unsustainably, even at their own demise. They are, in other words, analytical tools.

Learning Activity 3: Adaptive Management

How would climate change affect adaptive management of marine resources?

We come now to the concept of **resource rent**. Natural resources can often be exploited at a level that does not threaten sustainability or lead to depletion, and the revenues we collect from using these resources are called "rent." Resource rent is the value of what stakeholders or users harvest. With increasing use and overexploitation, rents gradually decline and can become negative. To avoid negative rents caused from overexploitation, and to act in the best interests of the collective rather than the individual, we must consider regulations. We turn now to examine who should benefit from regulations and who are the stakeholders; who should set regulations (private or public institutions); the necessary scientific information needed to manage sustainably; and the extent to which regulations will be observed when resources are held in common, such as in international waters.

8.2. Economic Adaptation and Management Needs

Deliberate sustainable management presupposes sufficient knowledge about the users, resources and the resource systems of which they form a part. This is challenging because knowledge is costly and takes time to gather or accrue. Moreover a resource system is not necessarily domestic, but may span other countries, thus implying multi-national use. To provide knowledge, which resource users can agree on as the accepted platform for management and regulatory measures, could thus affect national and international interests. Regardless of jurisdiction, sufficient knowledge is a critical factor in determining how to manage a resource. Furthermore, knowledge will provide information regarding necessary resource extraction restrictions, and how to adapt to changing resource availability.

As an example of **adaptive management**, where ecosystem management is flexible and can be adjusted to changes in the environment, consider societies with a long tradition of resource use. First, not all knowledge-based actions have to be founded in modern western science. Knowledge could be inherited, passed on orally through successive generations, or learned by observing actions rather than written words. Indigenous peoples are often said to belong to such a tradition of knowledge transfers and manage resources accordingly. There are many examples in the literature of common pool resources that are managed as a commons based on a local code of ethics, religion and traditional values. Such traditional knowledge often influences behavior in a way that favors long-term resource and community sustainability. Moreover, when the common group is relatively small and isolated, social control often works to influence human behavior with respect to resource use and overuse. Such situations are not likely to happen in bigger communities and resource user groups leading to the "tragedy" of overuse.

Adaptive management frequently requires harvesting restrictions that allocate resources as they become increasingly scarce with growing economic demand. New restrictions often give rise to concerns about fairness and equality. Should, for instance, local users with traditional adaptations bear the same costs as external, industrial resource exploiters? Is it fair that all users bear the costs of regulations? Are relatively new users treated the same as traditional and long-term users? Any restrictions must be legitimized in a democratic society. The motivation to abide by rules is to a great extent dependent on the degree of perceived legitimacy, being fair or not. Similarly, effective monitoring and legal prosecution is necessary for offenders who disregard rules.

How do we achieve legitimate regulative regimes to promote resource sustainability through adaptive management?

1. Relevant knowledge, whether science-based, traditional or a blend of the two, is essential in forming the knowledge base from which to build. Additionally, shared understanding and agreement of facts are essential to collaborate. Sometimes external and independent scientific advisory bodies are needed, for example, the International Council for the Exploration of the Sea (ICES), to give advice on the present state of a resource.
2. Another source of legitimacy is procedural, which pertains to the way regulations are decided on, monitored and revised. Rule compliance is most often dependent on the rules being made and how they are implemented; rules have to be justified out of legitimate procedures.
3. Legitimacy is associated with the degree of participation in making regulatory policies and/or in implementing them. A community-based management regime where those bearing the costs of regulations are also responsible for influencing rules and implementation will be regarded as more legitimate and efficient than external bodies without any local influence. The latter is often less cost effective by demanding more monitoring and control.
4. Another type of legitimacy stems from outcomes. If a policy works well and is seen as functional for those being targeted, it will be more readily accepted. Note that in reality, legitimacy stems from a combination of the types outlined above.

8.3. Resource Management Models

Up to this point, we have discussed the challenges to sustaining resources held in common, and the need for restrictions to promote sustainability and prevent resource collapse. The lack of regulations not only leads to over-exploitation and depletion, but it could also lead to *economic* collapse. When resources are diminishing, users compensate by increasing exploitation and harvesting efforts, leading to over-capitalization and a miss-match between harvest efforts and economic gains. This is why regulations must be introduced to secure economic and ecological sustainability. In the following section we present three resource management models that rely on different forces to regulate use.

1. Public Governance

The public governance model, also known as the state management model, is rooted in the political-administrative system and is used to formulate and implement policies that respond to the public's needs and demands. The state as an actor, in principle,

- Holds authority
- Is legitimate
- Makes and abolishes laws
- Is responsible for resource management, monitoring and rule adjudication.

Public governance is also supposed to play an impartial role when conflicting private interests are involved, and have established procedures for solving conflicts. And, by the rule of law there exists accountability. The state also has the authority to use force to implement legally based policies to prevent "tragedy of the commons". In short, the state or public authorities are expected to intervene in situations where individual human action might cause damage to the collective.

Resources could also be managed through bilateral and international agreements, whereby the state is the legitimate actor and represents or authorizes representation to develop solutions. The state could also own land and control resource use and exploitation. Indigenous peoples sometimes manage vast areas of land in the north, although such land is often controlled by the state. This is the case in Nunavut, a territory in northern Canada. Another example is rights to marine resources. The Law of the Sea gives nations control of resources within 200-nautical mile exclusive economic zones.

While public resource governance can be the best management option in some cases, it is not without fault. The rule of law (as it is also called) can be a lengthy political and administrative process that isn't conducive to efficient or effective solutions. Similarly, it is often encumbered by bureaucratic rigidity, sector conflicts and coordination challenges. And, with complex problems there are often information and knowledge gaps making the state model inadequate for solving resource conflicts. Furthermore, political-administrative solutions are formed in political environments and are subject to political pressure from stakeholders and user groups, which vary according to political system. For example, the Nordic countries are known for their consensus-oriented political style, which differs for instance with the Russian political system that has a far more complex governmental structure. Regardless of the political system, state resource management policies can be biased towards influential lobby groups and holds no guarantee for being balanced and impartial. Finally, monitoring and control activities are dependent on public budgets and the state's capacity to deal with the monitoring and controlling tasks that in the Circumpolar North cover vast areas. Public governance is in fact no guarantee for achieving sustainable management.

2. Market Resource Governance

The logic behind the market resource model is that common resources, despite limited access, should be governed by market mechanisms that provide incentives to harvesters to exploit resources sustainably. Giving long-term rights to individual users by privatizing common pool resources, and through selling and buying rights, market mechanisms will work to solve the over-capacity problem. The objective is to replace common rights with private rights to create

conditions for self-interest, thereby providing incentives for individuals to avoid ecological and economic collapse. In so doing, administrative costs are reduced, and private interests incur costs that are concomitant with private benefits.

Such arguments have been used to privatize fisheries, traditionally common or open access resources. Private rights are governed by trade and licenses, and quotas for vessels and catch amount. While this model works in theory, there have been cases, such as in Iceland where the result has been fewer participants, bigger vessels and centralization. In this example, fishing communities lost the right to land fish catches, and vessels, rights and quotas became commodities where the strongest bidders secured the majority of fishing rights.

Market models are not designed to perpetuate existing living or social conditions. Rather, such models focus on profit maximization and efficiency: two aspects of the market model that are often deemed unfair. While the market model often creates new structures and business arrangements, it is often accompanied by unemployment and displacement for those who are less efficient producers. Furthermore, recruitment of new actors depends on financial capacity, rather than social standing and community belonging.

Figure 1: An example of overgrazing.

Source:
http://en.wikipedia.org/wiki/File:Overgrazing.JPG
Public Domain. Photo by C. Goodwin.

It seems reasonable that actors would behave in a rational way to take care of long-term interests and to maintain resources in perpetuity. Theoretically, a private interest will use a resource in a way that maximizes a stream of benefits over time, and therefore, have an interest in acting responsibly (Figure 1). Similarly, if a private interest wants short-term gains, they possess the right to sell, and therefore, have a strong incentive to maintain the value of the resource. However, there is no guarantee that this will happen. Profits are shorter term than are ecological effects, the latter of which are not always easily traceable.

Turning common pool resources for the first time into transferable market rights is complicated and gives rise to the problem of determining who gets initial rights and what the cost might be for licensing, for example. The market governance model also favors larger industrial actors for whom profit maximization and efficiency is the driving force. Such large operators can achieve economies of scale, and in certain instances, natural monopolies can form. Therefore, it is essential to carefully monitor the transition from common pool to private resources.

3. Participatory Resource Governance

Restrictions on access and exploitation of scarce natural resources lead to situations where rules and decisions are questioned and challenged by the affected parties. Is the allocation fair? Has all available information been considered? These are examples of two questions asked in

northern Norway when coastal fishermen and communities experienced a significant cut in cod quotas from 1987 to 1990. Protests that included local councils and even clergymen and churches were mobilized to bring about a policy favoring the coastal fisheries and communities. People questioned the legitimacy of the policy and challenged the decision-making system.

A way to reduce tension and increase the legitimacy of a political process is to include stakeholders from policy formation to policy implementation. This approach is called participatory government or **co-management** whereby decisions are based on both western scientific knowledge and traditional knowledge. Co-management can increase the legitimacy of resource policy formation and management because more consideration can be given to local communities, indigenous rights and specific concerns. While this organizational model is often seen as an alternative to market rule, it is desirable where discourse among participants is preferred.

This model is also based on the state's authority to rule and make legally binding decisions. The state remains the basic actor but chooses to cooperate with the affected parties in an organized way, providing information and legitimacy to the policy process and its outcomes. Such a model provides great variations in the degree of delegation of authority to lower levels of government, and even to a participatory body itself, yet the state is ultimately responsible; and science-based information is at the core of the knowledge platform.

Participatory government is largely dependent on domestic political cultures that vary by state and are influenced by cooperating parties. Co-management regimes tend to favor long-term rationality, fair distribution and, increased legitimacy. However, the effectiveness of this model depends on how well stakeholders and user groups are balanced, the extent to which advice is taken, and the degree to which parties are pursing similar objectives. Ultimately, the choice of model is a question of politics, and the state of the resource.

8.4. International Cooperation and Sustainable Resource Development

International cooperation is important for sustainable resource development because often, resources are shared by nations. There are many ecological systems that span national borders, and many resources that do not belong to any nation. Good examples of these characteristics are found in many of the world's fisheries. International fishing vessels are often registered in remote states with no quota rights, and have for many years fished in international waters in the north, beyond national control and where bilateral treaties do not exist. Access to fish stocks has been open, leading to significant depletion and sometimes, extinction (Figure 2). During the last decade there has been growing pressure on northern fish stocks driven by globalization and decreases in transportation costs. To address overfishing it became important to secure property rights and move from open access to public ownership. In so doing, the northern nation states established exclusive economic zones by extending jurisdiction of adjacent sea areas from four nautical miles to 200 nautical miles, rooted in the Law of the Sea principles.

The fishing example illustrates the tragedy of the commons, and the importance of secure property rights and adaptive management in sustaining resources while pursing responsible resource development. Also important is the requirement for international cooperation and agreement to developing solutions, through international law and conventions often headed by the United Nations. As a result, while most of the world's fish stocks are being overexploited, fish stocks in the Barents Sea are being managed sustainably as a direct result of international and bi-lateral cooperation.

Resource **stewardship** is integral to environmental policy making and economic development, and is an international issue that requires coordinated actions across world communities. Many problems have to be addressed at the international level and cannot be solved nationally or bilaterally. The United Nations (UN) has for that reason been an important institution for recognizing environmental challenges and in its policy-making role to promote sustainable development.

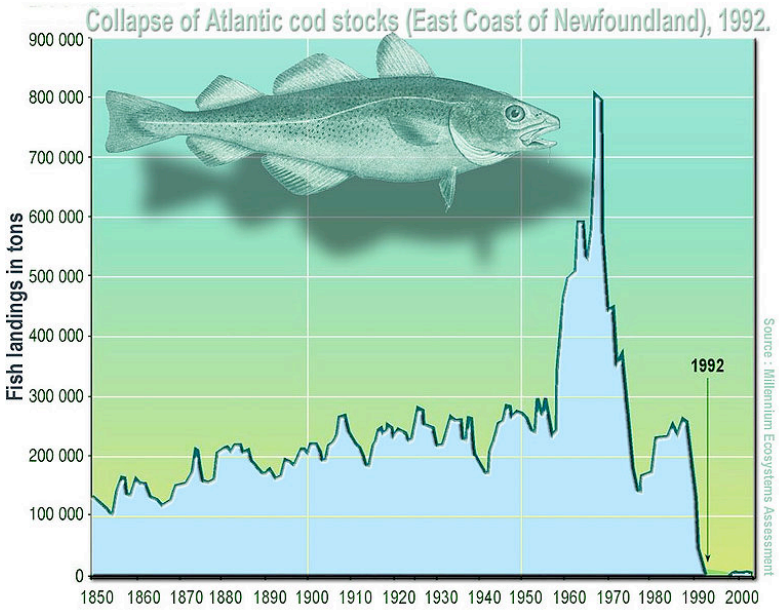

Figure 2: Collapse of Atlantic cod stocks near Newfoundland in 1992. Source: http://en.wikipedia.org/wiki/File:Surexploitation_morue_surp%C3%AAcheEn.jpg Public Domain. Author: Lamiot

The first UN conference on this issue was held in Stockholm, Sweden, in 1972, leading to the World Commission on Environment and Development, headed by the Norwegian minister for environmental affairs, Gro Harlem Brundtland. The work of this committee, often referred to as the "Brundtland-commission," submitted the final report, "Our Common Future" in 1987, suggesting that environmental issues be targeted by the world community. This work was followed up at the Rio Conference in 1992, United Nations Conference on Environment and Development (UNCED), resulting in the Rio Declaration on Environment and Development, Guiding Principles for Management of Forests, Agenda 21, and two important international conventions on climate and world biodiversity.

The Rio meeting represented a major step forward in setting the world's environmental agenda and contributed with important approaches to safeguard sustainable environmental development and use of natural resources. The Rio Declaration espoused sustainable natural resource development, avoidance of environmental damage and the use of the **precautionary principle** where scientific knowledge was lacking. The signatory states committed to pass domestic laws to protect nature and the environment and to mobilize their citizens to engage in environmental work. In summary, the Rio Declaration laid down important principles for further environmental action at the international, national and local levels. Agenda 21 was devoted to protection and stewardship of natural resources; the Convention on Biodiversity committed the signatories to protect, allocate and extract natural resources in sustainable ways while the Climate Convention focused on the need to protect the world climate—essential for the sustainability of northern ecosystems.

National environmental policies started to flourish in the 1970s in the wake of the UN's work on sustainable development, and have grown in importance since the UN meeting in Rio in 1992. Environmental non-governmental organizations (NGOs) have emerged as a driving force to pressure public authorities and the international community. Furthermore, NGOs have had a major effect on raising awareness and initiating public debate that sometimes results in civil disobedience. The necessity of public debate and engagement cannot be understated when it comes to forming and implementing environmental policies, of which sustainable resource stewardship is an integral part. Additionally, a free press to criticize and support public authorities, and thereby set political agendas, is a precondition for public engagement in environmental issues.

Recently all of the Arctic Council countries have accepted environmental NGOs who cooperate at international levels, thus changing the balance of political pressure. With the growing number of states ratifying UN conventions, including the Arctic states (with the exception of the US), international commitments and national political pressure has increased to protect, preserve and manage the environment and natural resources in a sustainable way.

8.5. Constraints to Implementing the Precautionary Principle

Establishing national reserves, protected areas and national parks has a long tradition in the Circumpolar North as a means of environmental protection. In these cases, indigenous rights are often given special status although national policies vary, ranging from total protection to various degrees of exploitation by well-defined stakeholders. Given competing interests for a resource, planning is often used to resolve conflicts and to allocate resources in a way that seeks to protect environments. States have different traditions as to the scope and use of planning as a managing means. The Nordic states have a long planning and regulatory tradition to prevent conflict, while other states are more inclined to seek the same objectives through legal systems.

When including many different stakeholders with competing views over a resource, it is sometimes difficult to develop a management plan that ensures resources will be sustainable. This is particularly true where traditional rights to resources have been observed, but over time, resource availability has decreased given rising demand. In these cases, restricting harvesting could be contentious and adhering to the precautionary principle difficult, or impossible.

Sustainable resource stewardship is also dependent on political culture and international commitments, and the domestic legal means available to form and implement policies. The rule of law is essential for all democracies and also for resource stewardship. However, although laws and practices must be regarded as legitimate, outcomes do not always favor sustainability. There must also be efficient implementation, policing and control systems; activities that call for state authority and economic resources. The Circumpolar North has vast areas of land and sea, and efficient resource control is sometimes difficult, especially in international waters where resources are not legally owned until captured.

Conclusion

Resource stewardship in the Circumpolar North has no doubt become more complex and challenging in the new millennium, especially with respect to the oceans. There is a need for improved ecosystem management and to include both regulatory policies for the extraction of non-renewable resources and the effects of climate change. Because new knowledge and scientific discovery is continually underway, society should not exploit resources too hastily; the

principle of precaution and adaptive ecosystem management should be two basic pillars of all resource management plans to ensure the good stewardship of circumpolar resources.

Study Questions

1. What is meant by the concept “common pool resources”? What is the rationale of “the tragedy of the commons” - are people rational in their behavior to over exploit resources?
2. Give an example of each of the three natural resource management models.
3. Explain the economic and environmental effects of increased use on natural resources.
4. How do the UN’s conventions affect sustainable management of natural resources?
5. How can the nation states contribute to sustainable resource stewardship?
6. From the Required Reading, synthesize Caulfield’s perspectives and conclusions in the *Arctic Human Development Report* on knowledge systems.

Glossary

Adaptive management: Flexible management of an ecosystem or resource in the case of political, economic or biological changes, for example.

Co-management: Devolution of power where public authorities include stakeholders to be a formal part policymaking and policy implementation.

Collective rationality: Rational behavior for a group pursuing social, collective or public goals.

Common pool resources: A resource held by a limited number of stakeholders often defined as the commons. This group can exploit common pool, or common property resources.

Ecosystem management: Management of an ecosystem rather than single species within an ecosystem.

Ecosystem: A community of living species and the relationship to their environment.

Individual rationality: A concept used to describe the behavior of an individual pursuing individual goals that maximize self-interest.

Limited access: Use and access for only stakeholders.

Precautionary Principle: Taking action that postpones or diminishes use or extraction until resources sustainability is known with more certainty.

Resource rent: an economic term describing the value of a resource net of all costs.

Sustainable development: A concept introduced by the Brundtland Commission that describes development that meets present demands without harming future generations’ demands.

Tenure: Rights to resources, and more generally, rights to assets.

Tragedy of the Commons: A term defined by Garret Hardin that describes where stakeholders act on self interest to maximize their own profit when extracting common pool resources. When all stakeholders act in this way it will lead to over-exploitation of a resource and resource depletion.

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